



Human

Fangruida: Mars ? Moon?

Fangruida: 50 cutting-edge technologies for landing on Mars, the moon, and emigrating to the moon Mars (Kate)
Fangruida: 50 technologies de pointe pour atterrir sur Mars, la lune et émigrer sur la lune Mars (Kate)
space immigration to transform the Moon and Mars Millennium Plan (Fangruida)

Human immigration safety-realistic and feasible 10 major planets (2,000-3,000-4,000-5,000-year) schedule and probability of success

(This is a wonderful keynote speech by Professor Fang Ruida at the Scientific Conference Commemorating Human
Lunar Day. It has been revised and revised by the author. It is now published as a special manuscript of important
reference value.)

literature for readers and netizens around the world. The original text is in English. The full text is as follows . Kate)
Preface

The vast universe is suitable for human immigrants to migrate safely-a realistic and feasible 10 major planets (2000-3000-4000-5000 years) schedule and probability of success. World Space Congress, Space Flight Day, Human Moon Day, United Nations Space Week and other important days are worth celebrating. The great mankind has lived on the earth for ten million years (strictly speaking, the real human society is probably only tens of thousands of years). From primitive human apes to thinking about modern humans, the earth has changed dramatically. After the 20th century, after the Stone Age to the Bronze Age, from the agricultural society to the industrial society to the intelligent and intelligent society, the earth society expanded to the planetary society, to the moon, to Mars, has become the first choice of the earth 's human beings to the infinite universe. Human immigration to the moon and Mars, transformation and utilization of the moon and Mars have mentioned the development and life agenda of the human millennium, which is of great significance, reversing the universe, breaking the earth, and shaking the world. The World Astronautical Congress, Space Flight Day, Human Moon Day, and United Nations Space Week are here to celebrate and commemorate all mankind. Celebrate and commemorate our ancestors and predecessors of all mankind, brave to explore, not afraid of sacrifice, to create a terrific and splendid achievement, flying out of the earth, landing on the moon, and winning the world. March towards the moon, towards Mars, towards a more distant planet. A great and glorious new era and a new world have arrived. Let nearly 8 billion people living on our planet raise their arms and warmly welcome this greater and more glorious era. This is not an illusory fantasy, but the greatest practice and realistic behavior. New research and development, new innovations and new journeys are gaining momentum. Here, we humans will run toward the moon, toward Mars, and toward a more distant planet with greater wisdom, greater power, stronger science and technology, greater courage and courage. The great lofty ideal of freedom of mankind will guide us all to ride the wind and waves, to move forward bravely, fearlessly, bravely and fearlessly, strong in wisdom, overcome all difficulties, and move forward bravely. Especially to the great space warriors and heroic space pioneers, I would like to pay my highest respect. You are shouldering the great trust and great sacred mission of all mankind, and you are the forerunners who entered the universe of the sparse profile, and will always be in the annals of history. In mankind In the military universe, many precursors and heroes sacrificed, and we will always commemorate and miss them. I think that at a time when mankind can fully expect victory, we will build a greater and more glorious monument for you on a beautiful planet, whether it is on the earth, the moon, or Mars, Jupiter.

The von Carmen Award, the Nobel Prize, the Moon Award, and the Mars Award, their great contributions and dedication, far surpass the value and great significance contained in these famous awards, and shine through the ages. Here, not only to great scientists

Explorers should pay tribute to these space warriors. For our children and grandchildren, thousands of years and tens of thousands of years later, they will surely deeply cherish and remember these martyrs and ancestors, yes, yes. Whether it is on the earth, or on the moon, or people who live on Mars or other planets.





1.

2020 is the window period for Mars exploration activities. Many countries plan to launch probes and carry out Mars research

And the preliminary preparations for landing on Mars. Opportunity is not to be missed. Entering the moon and Mars, transforming and immigrating the moon and Mars require a lot of preliminary exploration, preparation, simulation, experiment, research and development. Mars is one of the planets of the solar system. A "Mars sunburst" occurs about every 26 months. At this time, the distance between Mars and the earth will reach an extremely close value. During this time, the probe can be sent at a lower cost. To Mars, so human Mars exploration activities usually also have a climax every 26 months. In 2020, there will be an opportunity for "Mars Rising Sun". After the launch of the probe, it will take about 7 months to reach Mars. In addition to China's "Tianwen-1", 2020 will fly to Mars, as well as the US "Perseverance" rover and the UAE's "Hope" Mars probe. The ExoMars Mars rover, which was originally scheduled for "fire detection" this year, has cooperated with Europe and Russia and has been announced to be postponed until 2022.

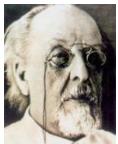
Therefore, 2020 is the best window period for Mars exploration and launch, and this good fortune must not be missed. Although a major global epidemic will occur in 2020 and the Olympic Games will be postponed, next year's Tokyo Olympics will be more magnificent and exciting for millions of people. Therefore, 2020 must also be a year of permanent history. Even under such circumstances, we will make good use of this window period and continue a series of space launches.



In addition to the United States and China, there are four countries or organizations planning to launch Mars probes in 2020. They are: the European Space Agency (ESA) ExoMars2020 lander and rover, the UAE 's Hope Orbiter, and the Indian Mars orbit mission. -2, as well as the Red Dragon Mars lander of SpaceX, a private space company in the United States. South Korea plans to launch a self-developed rocket in the first half of 2020, and launch a lunar orbiter and a lunar lander at the end of the same year. South Korea 's long-term plans for future exploration of Mars, asteroids, and deep space, like India, Japan has also prepared a series of space development plans, such as launching unmanned probes to the moon in 2021, and launching manned spacecraft to the moon in 2030. It will also participate in NASA's lunar base program.

The Indian Space Research Organization (ISRO) launched the Chandrayaan-2 probe, which entered lunar orbit in August. On September 7, Vikram, the lander of Lunar Ship 2, tried to land on the South Pole of the Moon and lost its signal 2.1 kilometers from the surface of the Moon.

At that time, the Israeli "Beresheet" (Beresheet) detector malfunctioned and lost contact during the descent, and finally crashed on the surface of the moon. The probe is a moon landing project initiated by the Israeli non-profit organization SpaceIL. If the landing is successful, Israel will become the fourth country after Russia, the United States and China to have a soft landing on the moon.



NASA will launch the "Perseverance" mission this summer. This Martian rover is called "robot scientist" by NASA, and weighs less than a few kilograms. It will look for traces of microbial life that once existed on the surface of Mars, evaluate the climate and geology of Mars, collect samples, and pave the way for human exploration of this red planet. The National Aeronautics and Space Administration (NASA) announced on May 13 that the next manned moon landing program was named "Artemis", which was taken from the "Goddess of the Moon" in Greek mythology. Despite a major epidemic in 2020, the US plan will still be carried out and will not be suspended due to the epidemic. Other countries will do the same, and continue to conduct space exploration and launch.





Despite the emergence of a new coronavirus pandemic, NASA insisted that the launch period of Perseverance will remain the same, from July 17 to August 5. Whenever it is launched, it will land at the Jezero Crater after 3:40 pm on February 18, 2021 EST. The first step will be carried out in July this year. NASA launches the Mars 2020 rover mission. Its "Perseverance" Mars rover will land in the Jezero crater on the surface of Mars in February 2021. .

NASA's Mars 2020 Rover Mars 2020 Mars Rover will be launched from Cape Canaveral Air Force Base in Florida in July 2020, and will land at the Jezero Crater on February 18, 2021. Mars Rover, the pioneer of human landing on Mars, is not only a scientific exploration expedition, but also an extremely important ultra-intelligent instrument for comprehensive scientific research and detection that first landed on the Martian ground, advanced intelligent automatic control, configuration is programmed by computer Control, etc., real-time video photo camera system, etc., can play a major role in advanced intelligent robots and multiple functions. In a sense, if all goes well, it can be compared to a semi-biological machine astronaut entering the Martian ground. crucial. The super-intelligent detector is actually a prelude to human landing on Mars, and subsequent projects will be gradually launched, including launching the advanced detector again. There are many kinds of NASA probes. The number of probes on Mars is very important. The Mariner, Warrior, Opportunity, etc. are spectacular. The Scatterer Project (Hoverer) (NASA) [1961-1965] (9 ships) Surveyor (NASA) [1966-1969] (7 ships)

Apollo Project (NASA) [1961-1972] (17 items)

Mariner 2 (NASA) 1962

Mariner 5 (NASA) 1967

Pioneer-Venus 1 (NASA) [May 20, 1978-October 8, 1993]

Venus 2 [1978]

Magellan [May 5, 1989-October 12, 1994]

Mariner 3 (1964)

Mariner 4 (1964-1965)

Mariner 6 (1969)

Mariner 7 (1969)

Mariner 8 (1971)

Mariner 9 (1971)

Pirate 1 (1975)

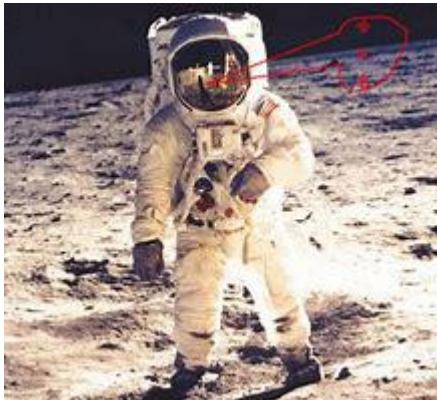
Pirate 1 (1975)
Mars Observer (1992)
Mars Global Surveyor (1996)
Mars Pathfinder (1996-1997)
Mars Climate Explorer (1998-1999)
Mars Polar Lander / Deep Space 2 (1998)
Mars Odyssey (2001)
Mariner 10 (1973-1975) [NASA]
Helios 1 (1974-1975) [NASA / DLR]
Helios 2 (1976-1977) [NASA / DLR]
Solar Maximum Mission Satellite (1980-1989) [NASA]
Ulysses (1990-2008) [NASA / ESA]
SOHO satellite (1995-present) [NASA / ESA]
TRACE satellite (1998-present) [NASA]
Pioneer 10 (1972-1997) [NASA]-Jupiter Mission (1973-1974)
Pioneer 11 (1973-1995) [NASA]-Jupiter Mission (1974-1975)
Voyager 1 (1977-present) [NASA] ---- Jupiter Mission (1979)
Voyager 2 (1977-present) [NASA] ---- Jupiter Mission (1979)
Ulysses (1990)
Galileo (1989)
Cassini (1997)
2000 "Neil-Somek" probe
2001 Odyssey Mars Orbiter Origins Probe
June 30, 2001 WMAP cosmic background radiation detection
2002 RHESSI
2003 Mars Rover of Courage Opportunity Mars Rover Wisdom One
2004 Courier
2005 Mars Survey Orbiter
2006 STEREO New Horizons
2007 Phoenix
2009 Firefly One Lunar Reconnaissance Orbiter
2016 Neptune Probe

Space probes play an extraordinary role in human conquering the universe and marching into the universe. After the former Soviet Union, the United States has launched 9 Prowler and 7 Surveyor lunar probes. Of the seven surveyor probes launched on January 1, 1968, two failed and five succeeded. Later, the United States launched another five lunar orbiting circulator to provide detection data for Apollo ' s manned lunar landing site. After this series of unmanned detection, it played a particularly important role in successfully landing on the moon. Therefore, the successful landing of the Mars rover will undoubtedly give the astronauts a successful landing and march role for the successful landing of Mars. Despite the unmanned landing, the leading and demonstrative will greatly help and guide the manned landing. Without the success of the probe, marching to the moon and Mars is a dream that is simply impossible to achieve.



In addition, SKA is the world 's largest integrated aperture radio telescope planned to be built by the international astronomy community, and its receiving area is as much as one square kilometer, which is greater than the current largest centimeter

The JVLA sensitivity of the wave synthetic aperture telescope is increased by 50 times, and the search speed is increased by 10,000 times. SKA will eventually build thousands of reflector antennas and more than one million low-frequency antennas. All these telescopes are equivalent to a very large telescope with a reflection area of up to 1 square kilometer.



The moon and Mars are very important to humans on earth. In other words, the new coronavirus pneumonia, which is popular all over the world

Shows all mankind, in addition to some man-made factors, how important is the profound mystery of the natural universe to mankind. A small round-crowned virus cost humanity a huge price. Therefore, marching into the moon and Mars, its great significance and unparalleled scientific value and practical survival value can not be counted in hundreds of trillions of dollars, but fortunately God has given humanity trillions of trillion planets, especially for us Humans are a moon, a Mars, is this not a blessing star?

All the living beings, who is the first person to land on the moon and Mars in the upcoming space race?

Gagarin, Aldrin, Columbus, Musk, Bezos ? or Neil Alden Armstrong? NASA astronauts, test pilots, and naval pilots are known for being the first humans to step on the moon when performing the first manned spacecraft Apollo 11 mission. Neil Armstrong's first space mission was the commander of Gemini 8 executed in 1966. In this mission, he and David Scott completed the first docking of the spacecraft. Armstrong's second and final space mission was the famous Apollo 11 in July 1969. In this "a big step for mankind", Armstrong and Buzz Aldrin performed a two-and-a-half hour walk on the lunar surface (Michael Collins orbited the moon in the command module).

2.

March 2020 to the moon, to Mars, to a more distant planet (overall human migration project)

Preferred planets include risk factor, realistic feasibility, reliability and security, total cost of investment, technology maturity, completion time, probability of success assessment, commercial rate of return, etc.

1 ♣♣♣♣♣ Earth (Arctic and polar regions, deserts, mountains, deserted beaches, oceans, etc.) 500 trillion USD High

2 ♣♣♣♣♣ Moon Yes One can immigrate 1 billion to 2 billion people 350-2250 trillion Yes High

3 ♣♣♣♣♣♣♣ Mars May 2 Immigrant 1 billion-6 50-3200 trillion Pending

4 ♣♣♣♣♣♣♣ Jupiter satellite 2 4 standby low





-5 ★★★★★★★★★ Saturn satellite Saturn 6 five waiting low

Aerospace engineering is complex and difficult, with high risks and high investment. Therefore, it is very important to vigorously improve the maturity of various major technologies and vigorously reduce investment costs. It is also the key to success. Of course, the huge investment is not worth the loss, its significance and value is very great. This cannot be simply calculated from banknotes. The second earth, the third earth, is worth many cities. At least it is estimated that the direct commercial value is several hundred billion to several trillion dollars, and the indirect commercial value is several hundred billion dollars and tens of millions of tons of gold. Short-term success is unrealistic and short-sighted. Of course, it is important and urgent to proceed from reality, work within our abilities, try our best to reduce costs, develop high and new technologies, combine commercial operation with scientific exploration, and make steady progress. Some people think that this is a waste of money.

《Small-scale immigration to transform the moon invests US \$ 100 billion to US \$ 500 billion, and builds immigration point stations of 20-100 people, with a total investment of about US \$ 60-90 billion or less, depending on the degree of technical development.

Simple small-scale immigration transformation to Mars Investment of 300 billion US dollars-1.5 trillion US dollars "Simple landing to Mars and the total investment is about 50-100 billion US dollars, depending on the maturity of the main root science.



(Alternative planet)

Long-term planning for thousands of years and tens of thousands of years later (the reality is quite far and far away)

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6Kepler-438b,

7Kepler-62e,

8Gliese 832 c,

9Kepler-1544b,

10Gliese 180 c.

The average daily distance is 149600000 km (1 AU)

Diameter 12756.3 km

Mass 5.965×10^{24} kg

Density 5.52 g / cm ³

Gravity 1 G (9.8 m / s²)

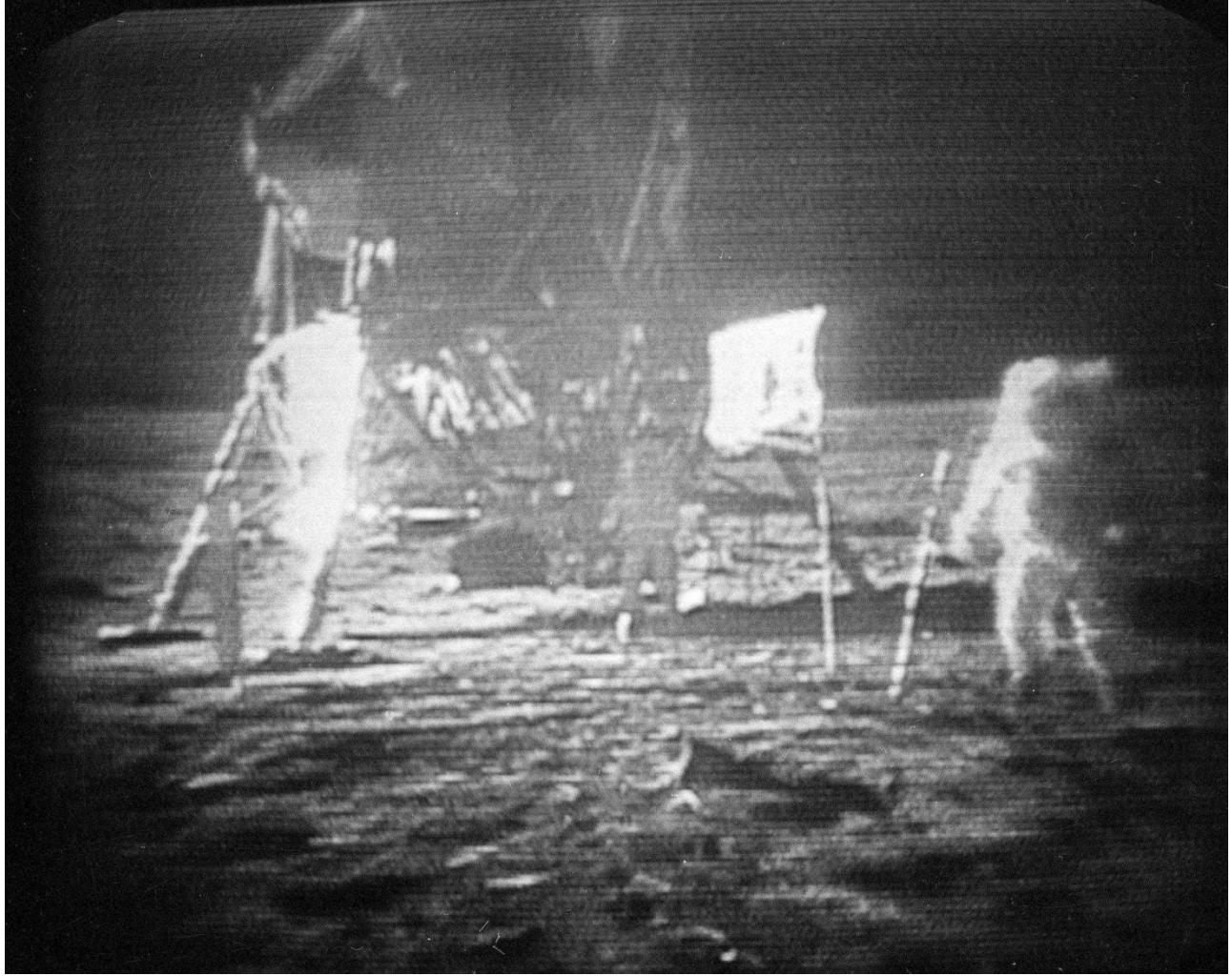
Orbit 365.2422 Earth Day

Rotation 0.9973 Earth Day (23.9352 hours)

A beautiful earth, a miracle of life, is a coincidence of the universe or a masterpiece of God? The earth is the third planet of the solar system. There is a moon called the moon. The protection of the earth's atmosphere and the proper distance from the sun are important conditions for the origin of life.

Earth is the third planet farthest from the sun. It is also the rocky planet with the largest diameter and the largest specific gravity. It is also the only planet known to have life. The rock and metal inside the earth show that it is composed of a typical plate. As the plates are pushed, activities such as earthquakes and volcanoes will occur at the junction. The earth's atmosphere and the same protective layer can block radiation from the sun's harmful human bodies and prevent meteors from hitting the planet's surface. In addition, it can store enough heat to prevent the temperature from dropping sharply. Seventy percent of the earth's surface is surrounded by water, and no such liquid forms of water are found on the surface of other planets. The earth has a natural moon, the moon, and its surface is covered with large and small craters. The moon is large enough to treat these two celestial bodies as a dual planetary system.

The earth also has a geomagnetic field. The north and south poles of the current geomagnetic field are just opposite to the geographical north and south poles. The geomagnetic field is also protecting life on the earth.



Average daily distance 227940000 km (1.52 AU)

6794 km in diameter

Mass 6.4219×10^{23} kg Mars

Density 3.94 g / cm ³

Gravity 0.38 G

Revolution 686.98 Earth Day

Rotation 1.026 Earth Day (24.624 hours)

Of the approximately 165 satellites in the solar system, only 6 satellites (Europa, Europa, Titan, Europa, Titan, and Triton) have an atmosphere. Unlike oxygen in Earth's atmosphere, Europa's oxygen is not biologically formed. It is most likely due to the charged particles in sunlight hitting Europa's icy surface to produce water vapor, which is then separated into hydrogen and oxygen. The hydrogen detached, leaving behind oxygen.

The composition of Europa and Europa is similar to terrestrial planets: mainly composed of silicate rocks. But unlike Europa, Europa's outer layer is distributed with ice up to 100 kilometers in thickness. Due to its internal energy source,

deep under the ice may have a liquid water world. The surface of the celestial body is very "smooth" and the number of impact craters is small, which indicates that the geological structure of "Europa" is relatively active. The data sent back from Galileo indicate that Europa has an internal layered structure and may have a small metal core.



The main composition of Europa is similar to terrestrial planets, that is, it is mainly composed of silicate rocks. Its surface is covered with water. It is estimated that the thickness can be up to hundreds of kilometers, and the upper layer is a frozen ice shell, but there is a liquid ocean under the ice shell. Under the influence of Jupiter's magnetic field, Guardian II can generate an induced magnetic field itself. This discovery implies that there may be a conductive layer similar to the salt water ocean in its surface layer. Guardian may also have a metallic iron core.

Europa's surface temperature averages 110K (-163 °C) in the equatorial region, and the poles are lower, only 50K (-223 °C), so the surface water is permanently frozen. However, the thermal energy provided by the tidal force may keep the water below the ice on the surface liquid.



Its surface is generally smooth, with few undulations over a few hundred meters, but in some areas a drop of nearly one kilometer can also be observed. Europa is the smoothest object in the solar system. Its conspicuous criss-cross patterns, the so-called retro-reflective features, are caused by low-lying terrain. With very few impact craters, Europa is one of the satellites with the highest albedo.

Planets outside the earth that are suitable for human habitation:

The main reasons are as follows:

- A. The atmosphere of other celestial bodies does not have enough oxygen concentration, and human beings cannot survive.
- B. There is no large amount of liquid water available for human use on other stars.
- C. The climate environment of other stars is not suitable for human production activities.



However, Mars is the planet most likely to be a human habitation except Earth:



- (1) The distance between Mars and Earth is close to the Sun.
- (2) Mars and Earth are similar in size.
- (3) Mars has an atmosphere similar to the earth. Although oxygen content is scarce, it can be modified to achieve the same content.
- (4) There is solid water or even liquid water on the Martian poles.
- (5) There are no highly intelligent creatures on Mars, and humans do not have competitors.
- (6) The geological and geographical environment of Mars is relatively favorable, which is suitable for human permanent migration and transformation.

After transformation, Mars may become a planet inhabited by humans.

At that time, the United States spent 25.5 billion US dollars to land on the moon about 380,000 kilometers from the earth. At the peak of the project, 20,000 companies, more than 200 universities and more than 80 scientific research institutions participated in the project, with a total number of more than 300,000. For 8 years. The closest distance between Mars and the earth is 50 million kilometers, and the longest distance is about 400 million kilometers. The one-way flight to Mars takes about 250 days (the one-way flight to the moon only takes about 4 to 5 days), so go Mars will bring a series of serious technical challenges, even now is very difficult. Investment and technology are the main points. Cost reduction is the most important. Otherwise, it is difficult to make a trip. The moon is much easier than Mars, so when it comes to being the first choice, the cost is low, the safety is reliable, the round trip is easy, and the commercial profit is large. It is very close to the earth. Usefulness is a rare first choice. Enter

Military and immigration to the moon are very important to human beings, and we must not consider it simply in terms of gold. Entering the moon and emigrating to the moon is the greatest pioneering activity for humans to truly step out of the animal kingdom and explore the universe. Its significance is far more than the Homo erectus revolution, the Neolithic revolution, the industrial revolution, the discovery of the new continent by Columbus, the computer revolution, the nuclear energy revolution, and the universe revolution planet. The engine of revolution cannot be underestimated, and its economic value is equivalent to the sum of dozens of earths and is inestimable. Of course, it takes time to show. Only great vision and strategic vision can make myopia and distant vision.

Titan is similar to the earth, and may have the possibility of human habitation in the future.

Through the observation of the Cassini-Huygens probe, scientists discovered that the desolate planet Titan has an amazing similarity with the earth. There are huge methane smoothies, and huge methane lakes begin to disappear under climate change.

Titan's atmospheric pressure is a little higher than that of the earth, and the pressure on the planet's surface is 1.5 times that of the earth. The dense clouds on Titan's surface obscure its surface features. People generally think that Titan's surface is solid or liquid ethane. From the radar survey of the earth, there is no large-scale ethane ocean, but there may still be a small ethane lake. Later, scientists studied the photos returned by the Cassini spacecraft, and believed that there might not be a sea of liquid methane on Titan. Researchers once observed Titan through a ground-based telescope. At that time, they believed that there were signs that there might be a liquid ocean on this Saturn satellite. However, scientists still have doubts about the conclusions drawn, because previous observations showed that the surface of Titan is indeed flashing liquid reflections, especially the observations made by large radio telescopes a few years ago prove that there is a high possibility of liquid ocean.

98.44% of Titan's atmosphere is nitrogen, the only nitrogen-rich star in the solar system except Earth, where there are a

large number of different types of hydrocarbon residues (including methane, ethane, butadiyne, propyne, propynenitrile , Acetylene, propane, and carbon dioxide, cyanide, hydrogen cyanide, and helium). These hydrocarbons are believed to come from

The surface of Titan is like a precipitate of organic matter coated with a layer of asphalt called tholin. Titan has no magnetic field protection, so when it sometimes runs outside Saturn 's magnetosphere, it is directly exposed to the solar wind. This causes the atmosphere to ionize and release some molecules in the upper atmosphere.

When approaching the surface, Titan's temperature is about 94K (-179.15 °C). Water ice will sublimate at this temperature, so there will be a small amount of water vapor in the atmosphere. On the surface of Titan, in addition to the fog covering the world, there are various clouds. The cloud may be composed of methane, ethane, or simple organic matter. Other rare and complex chemicals are why Titan 's appearance in space is orange

The planets and satellites that may be livable are comprehensively evaluated, and the two index systems of planet livability index and earth similarity index are designed to rank the possibility of planets that may have alien life. Among them, Saturn's largest moon Titan and exoplanet Gliese 581g ranked first among the two major indicators. The limited satellites of the solar system can provide a corner and living space for human immigrants.





There are about 10 billion stars in the Milky Way, and the number of planets with a high biological complexity index has reached about 100 million. At present, we only observe about thousands of exoplanets, and most of the distances from us are within a thousand light years, there is already an amazing potential livable planet at this distance, such as Glizer 581, which is about 20 light years away.

3.

The main cutting-edge technical support for the immigration to the moon (Mars):

- (1) High-speed heavy-load rocket
- (2) Lunar low-altitude vehicle
- (3) Lunar transportation simple space tunnel
- (4) Lunar automatic large recoil parachute
- (5) Lunar holographic engineering off-road vehicle
- (6) Lunar mini hospital
- (7) Living warehouse and base camp on the moon base
- (8) Lunar micro-nuclear power plant and solar power launching station
- (9) Space disease medicine and radiation protection medicine
- (10) Special water source and oxygen station
- (11) Nutrient soil space soil planting technology
- (12) namely Time communication system
- (13) Miniature high-energy automatic maintenance station
- (14) Spare first aid aircraft, spare take-off and landing rocket
- (15) Scientific research station, various lunar instruments and equipment
- (16) Lunar

radio telescope (17) Lunar geological probe, Geological mini-diggers, special automatic rock drills, etc. (18) Special space suits (flight suits, life suits, work clothes, etc.) (19) Geological water source sniffer, etc. (20) Special radiation protection computers and advanced programs. (20) Others, etc. There are about tens of thousands of sub-items in the total item, which is complicated. Here are just the main inclusions, with a lot of details, and I will not elaborate on them one by one. (21) Lunar intelligent robot (22) Lunar heat and radiation shield (nuclear power, solar cooling and heating automatic induction machine compartment) (23) Lunar underground tunnel (24) Lunar geological rock water detection excavation and conversion system (25) Fully automatic Water source recovery, purification and regeneration device (26) Special reserve water source for cargo spacecraft (27) Cargo spacecraft mining (28) Rocket spacecraft recycling and reuse (29) Nuclear-powered composite rocket (dual-engine high-speed heavy-load rocket) (30) Moon culture and entertainment measures, Psychological adjustment, etc. Lunar water, energy, air, lunar soil planting, lunar temperature difference, lunar radiation protection, lunar meteorites and many other lunar problems and difficulties need to be faced. The most rare is the lunar water resources, followed by temperature difference, meteorite protection and so on. 31.

Lunar temperature difference processing is mainly the construction of the lunar living cabin living base, thermal insulation and cooling, heating and cooling, etc. 32. Meteorite protection is related to the life of the lunar man. One is the forecast and warning sky-eye detector. The second is protective clothing. The third is the open-air protective net. The underground protective net. Fourth, underground safe tunnels, open-air safe buildings, etc. Therefore, the moon is not the final option, but it is necessary to occupy the moon, use the moon, and transform the moon. This is the most important and great step. Without the success of the moon, it is possible to go straight to Mars, but from an overall analysis, it is more difficult to go straight to Mars, and the cost will be greater. Moreover, the time is not ripe.

(33) The physical effects of human exposure to high cosmic rays and free radiation, cosmic radiation protective clothing (34) Physical effects on human body caused by long-term low gravity environment, such as vision loss, space disease (35) Physical impact on human body in long-term dark environment (36) Psychological effects caused by being far away from the earth Psychological rehabilitation Space syndrome (37) Psychological impact caused by lack of connection with the earth society (38) The impact of several astronauts living in closed spaces for a long time (39) Lack of medical equipment, micro space medical capsule, space surgery (40) Space mirror, telescope

(41) Asteroid impact protection

(42) Retrofit project for manufacturing greenhouse gases

Release the atmosphere

(43) Planting plants, space planting, plant cultivation

(44) Frequent sandstorm protection against danger

(45) Toxic soil containing perchlorate Purification treatment Soil improvement

(46) Lunar Rover Mars Rover (47) Lunar Satellite Mars Satellite. Satellite launch

(48) Moon landing high-speed cable car (cargo cable car) cargo landing device (automatic umbrella)

(49) Lunar Night Vision Telescope

(50) Lunar Polar Off-road Engineering Vehicle

"Most of the projects can be carried out on the moon or Mars. If simplified, you can delete the complicated ones.

Simply select the important projects and do not have to apply them all to strengthen technology integration and reduce costs such as maintenance costs."

Technology is not in place, investment is much larger than the moon, and the risk is greater. If you land on the Mars rashly, the probability of success cannot be said at all, but the probability of failure is even greater. People and scientists are optimistic about Mars and favor Mars. Of course, it is correct, but this is only the next step of the follow-up project. Therefore, this article mentions many technical points of the moon (Mars). The two are similar or similar. The transformation of the moon immigrants also includes the transformation of the Mars immigration and the Jupiter satellite Saturn.

The lunar project is as complicated and difficult as the Mars project. It is the most advanced scientific and technological integration. It is indispensable. A little carelessness will bring the most dangerous consequences. The above points are even more so. Many people think that the moon is not as ideal as Mars, and it is more affordable to try to step into the sky and enter Mars immediately. Without the first step, it is impossible to get out of the second and third steps. Space

science and aerospace technology must be very rigorous and seamlessly connected, otherwise, you will encounter great troubles and setbacks, and even the most dangerous disasters. Of course, landing and transforming the moon and Mars are also simple and complicated. Simply landing on Mars and returning to Earth is naturally easier; if you want to survive and move, it will be very complicated and difficult. It is easier to travel to and from the moon.

Lunar engineering is easier than Mars. Mars is more complicated and difficult, but the main cutting-edge technology support is similar or has big changes, which will not be repeated here.

The conditions on Mars are much better than those on the moon. Occupying Mars and emigrating Mars is the ideal wish many scientists dream of. One day, the far walker set foot on this magical and beautiful land for the first time, fortunately the heart can be imagined. When Columbus discovered the New World, people were very happy. In 1967, the first time an American astronaut stepped on the moon was filled with emotion. When humans land on Mars, the astronauts will step on Mars for the first time, and the world will cheer. However, sailing to Mars is more complicated and difficult than landing on the moon, and it will even pay a high price. Manned flight and unmanned flight, the voyage of the planetary probe is very different, can not be confused. The probe successfully landed Mars, Mercury, Venus, etc. for many times, and it was a manned flight and was able to return to Earth safely. Well, flight is undoubtedly a failure or even a tragedy and tragedy. One hundred secrets and one sparse, technical redundancy, technical reserves should be more sufficient and perfect. Naturally, scientific experimentation cannot be perfect, seamless, there will always be failures and frustrations, and there is no fear of fear, and the courage to move forward is also a misconception. Failure must also be allowed, otherwise there will be no success. Space science itself is a high-risk enterprise. Flying a spaceship and flying a plane are not concepts, although astronauts mostly come from pilots.

At present, the only planet suitable for human habitation is Earth, and the planets that may be suitable for human habitation are: Kepler-438b, Kepler-62e, Gliese 832 c, Kepler-1544b, Gliese 180 c. Scientists have made remarkable achievements in research and exploration. Of course, it is currently difficult to achieve, and can only exist as a reserve for scientific research.

1. Kepler-438b: This planet in Lyra was discovered by scientists at the Smithsonian Astrophysics Center at Harvard University. It is about 470 light-years away from Earth. It revolves around a white dwarf star, satisfying the conditions for human habitation: a solid solid surface and potentially flowing water.
2. Kepler-62e: This planet is 1200 light-years away from the earth, this is a potential water source planet. The climate above it is humid with cloudy weather all year round. Its rotation period is about 122 years, and its size is about 1.6 times that of the earth.
3. Gliese 832 c: This planet is located in the constellation Aquila, may have a temperature similar to that of the earth, and has a very obvious four seasons change. It may have life on it, but it may also be like Venus, with a high temperature.
4. Kepler-1544b: This is a recently discovered planet, first reported in 2016. Kepler-1544b is about 1138 light-years away from Earth. Its revolution period around its own star is 168.8 days. It also satisfies human living conditions.
5. Gliese 180 c: This planet is only 38 light-years away from the solar system. Of course, the planet also meets the living conditions. It is considered to be a super-Earth, and its size is about 6.4 times that of our planet.(Many scientists are optimistic about Venus and other long-term goals)

6. Some would argue that the universe is too big and the stars are too bright. Is it useful to choose so many planets? Can the threshold of human existence meet the capacity of the universe? Can humans fly out of the solar system? These questions and questions are very welcome. There is no direct and inevitable connection between the existence of human beings and the natural universe, and even if human beings die, the death of the moon, the earth and Mars does not completely equal the death of the universe, that is a different concept and proposition, although closely related. The extinction of species like humans, which is not absolute, means that the creation and emergence of other species or life forms, inorganic to organic, will occur, not necessarily in the solar system, in the Milky Way. As for whether human beings can fly out of the solar system, it depends on whether various conditions are available, whether they are coupled, the overall changes of the natural universe and the local evolution of the solar system and the Milky Way, the survival threshold of living human beings and so on. It would be pointless to talk about it without these natural and necessary conditions.



Finding a second planet suitable for human habitation has always been a difficult problem for scientists to overcome, but the planets that have been discovered so far still exist. Kepler-22b is one of them. Scientists believe that Kepler-22b is the first planet found suitable for human habitation. Kepler-22b, the first habitable planet

In 2015, scientists discovered the Second Earth Kepler 452b and said that it is very suitable for human habitation, but in fact Second Earth Kepler 452b is not the first human-inhabitable planet discovered. The first human-friendly planet was discovered as early as 2011, called Kepler-22b, known as the Earth's "twin".

The radius of "Kepler-22b" is about 2.4 times that of the earth. Scientists have previously discovered many planets in the "habitable zone", but unfortunately they are mostly gas planets with huge volume, which are not suitable for life. "Kepler-22b" is not much larger than the Earth. The parent star around it is slightly smaller and colder than the Sun (luminescence is 25% lower than the Sun), but it is relatively stable and has a long life like the Sun star.

The Kepler-22b planet is about 600 light-years away from the Earth, its volume is 2.4 times that of the Earth, and its

surface temperature is about 21 degrees Celsius, which is very suitable for living. In addition, there may be liquid water on this planet, and liquid water is regarded by scientists as a key indicator of the existence of life. It is also like the earth orbiting the sun, orbiting a star similar to the sun every 290 days. However, if you want to emigrate to Kepler-22b, it is actually very unrealistic, and now it is difficult to achieve.



Interstellar traffic

According to calculations, Kepler 22b is about 620 light-years away from the earth, which means that if humans travel interstellar at the speed of light, it will take 620 years to reach Kepler 22b, and our human life span is only 100. In the next ten years, this is almost impossible.

In fact, if migration is really possible, the problems faced by mankind are far more than the above difficulties. For Kepler's 22b planet, perhaps the planet is indeed suitable for human habitation, or the planet is just a human traveler looking for a migration planet, then human exploration. The pace of the universe will take more time. I believe that within the scope of human power, humans will go better and better to find a livable planet similar to Kepler's 22b planet.

The global village needs to be built and transformed. Lunar immigration and transformation are very important. It requires less investment, mature technology, safe and reliable, and Mars is second. Many conditions are better than the moon, but the cost is large, the risk coefficient is also large, the distance is far, and the technical difficulty is different. The advantages and disadvantages need to be comprehensively analyzed, judged, and decided to choose or advance simultaneously. Therefore, it is particularly important to introduce the moon immigration establishment, including the back of the moon. Who can get ahead first is a race in space. More importantly, it is an important springboard for human immigration, the best space test site, and an important space base for marching into Mars and other planets. It is difficult to replace any space station or earth. This is the fundamental reason for repeatedly emphasizing that the moon is the first choice and the first choice. Relying on existing science and technology, immigration, transformation and utilization of the moon can basically be carried out and carried out, and investment is also acceptable. Commercial operation will bring high returns on investment. Mars has a large investment, imperfect technology, large-scale high-speed heavy-load rockets, space diseases, space radiation, space viruses and other issues have yet to be resolved. Therefore, it is more scientific and reasonable to step back and only have a greater chance of winning.

In tens of thousands of years, people will remember how our ancestors came out of the Earth, to the moon, to Mars, to survive in the new space. Of course, that's another story. This is the day of the moon walk, the day of the Mars Walk, the day of the walk, the day of the walk, the day of the walk.

High-intelligence bio-robot High-intelligence multi-function integrated detector can, to a large extent, be able to simulate bionic movements at high latitudes and multiple orientations, and can replace many of the work of astronauts. (Of course, drone landing is different from manned landing). The successful landing of Mars by the highly intelligent multi-functional integrated detector of highly intelligent biological robot can also be used as a field preview of landing on Mars. This is of great significance for the future manned landing on Mars. Low cost, safe and reliable, it can be carried out many times, and sometimes it can surpass astronauts' large number of scientific investigations, qualitative and quantitative analysis of various quantitative data parameters, etc., which is the first important strategic tactic of human landing on Mars. The most difficult thing about landing on Mars (the moon) is first: A. High-speed heavy-load rockets. B. Anti-radiation C. Space syndrome D. Space emergency medical equipment Space surgery Space medicine etc. E. Mars (moon) water resources F. instant messaging and other issues. This is among the top priorities. Only when these technologies are fully mature and in place, can mankind successfully land on Mars. Otherwise, there will be insurmountable obstacles, even the result of failure and fiasco. Regardless of the moon and Mars, they need to be treated

with a more rigorous and realistic scientific attitude. They cannot be blindly confident, nor can they be afraid of their feet. Steady progress is the only choice.

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United Nations official website

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International Astronautical Federation

NASA

Russian Space Agency

German Aerospace Agency

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Mars Exploration Journey

Hou Jianwen is waiting

Landing on Mars: "Spirit" and "Opportunity" Red Planet Adventure Tour

[US] by Squills

Soyuz spacecraft

Hall, by Scheele

Announcement of the European Space Research Agency

"Progress in Aerospace Science", etc.



(This is a wonderful keynote speech by Professor Fang Ruida at the Scientific Conference Commemorating Human Lunar Day. It has been revised and revised by the author. It is now published as a special manuscript of important literature for readers and netizens around the world. The original text is in English. The full text is as follows . Kate)

#Lunar Mars pictures and pictures are quoted from related websites and pages Wikipedia.



L'immigration spatiale humaine pour transformer le Plan du Millénaire de la Lune et de Mars (Fangruida)

Immigration humaine réaliste et réalisable 10 planètes majeures (2 000-3 000-4 000-5 000 ans) calendrier et probabilité de succès

(Il s'agit d'un merveilleux discours d'ouverture prononcé par le professeur Fang Ruida à la Conférence scientifique commémorant la journée lunaire humaine. Il a été révisé et révisé par l'auteur. Il est maintenant publié en tant que manuscrit spécial d'une littérature importante pour les lecteurs et les internautes du monde entier. le texte original est en anglais. Le texte complet est le suivant. Kate)



Le vaste univers convient aux immigrants humains pour migrer en toute sécurité - un calendrier réaliste et réalisable de 10 planètes majeures (2000-3000-4000-5000 ans) et une probabilité de succès. Congrès mondial de l'espace, Journée du vol spatial, Journée de la lune humaine, Espace des Nations Unies La semaine et d'autres jours importants méritent d'être célébrés. La grande humanité vit sur la terre depuis dix millions d'années (à proprement parler, la vraie société humaine n'est probablement que des dizaines de milliers d'années). Des grands singes primitifs à la pensée des humains modernes, la la terre a radicalement changé. Après le XXe siècle, de l'âge de pierre à l'âge du bronze, de la société agricole à la société industrielle en passant par la société intelligente et intelligente, la société terrestre s'est étendue à la société planétaire, à la lune, à Mars, est devenu le premier choix des êtres humains de la terre vers l'univers infini. L'immigration humaine vers la Lune et Mars, la transformation et l'utilisation de la Lune et de Mars ont mentionné le développement d'un e programme de vie du millénaire humain, qui est d'une grande importance, renversant l'univers, brisant la terre et secouant le monde. Le Congrès astronautique mondial, le Jour du vol spatial, le Jour de la lune humaine et la Semaine spatiale des Nations Unies sont ici pour célébrer et Célébrer et commémorer nos ancêtres et prédecesseurs de toute l'humanité, courageux à explorer, sans peur du sacrifice, pour créer une réalisation formidable et

splendide, voler hors de la terre, atterrir sur la lune et gagner le monde. la lune, vers Mars, vers une planète plus lointaine. Une nouvelle ère grande et glorieuse et un nouveau monde sont arrivés. Que près de 8 milliards de personnes vivant sur notre planète lèvent les bras et accueillent chaleureusement cette ère plus grande et plus glorieuse. Ce n'est pas un fantasme illusoire, mais la plus grande pratique et un comportement réaliste. De nouvelles recherches et développements, de nouvelles innovations et de nouveaux voyages prennent de l'ampleur. Ici, nous les humains courrons vers la Lune, vers Mars et Towa Une planète plus lointaine avec plus de sagesse, plus de puissance, une science et une technologie plus fortes, plus de courage et de courage. Le grand idéal noble de la liberté de l'humanité nous guidera tous pour faire face au vent et aux vagues, pour avancer courageusement, sans peur, courageusement et sans crainte, fort de sagesse, surmontez toutes les difficultés et avancez courageusement. Surtout aux grands guerriers de l'espace et aux pionniers héroïques de l'espace, je voudrais rendre mon plus grand respect. Vous portez la grande confiance et la grande mission sacrée de toute l'humanité, et vous êtes les précurseurs qui sont entrés dans l'univers du profil clairsemé, et vous serez toujours dans les annales de l'histoire.

Dans l'univers militaire, de nombreux précurseurs et héros se sont sacrifiés, et nous les commémorerons toujours et nous les manquerons. Je pense qu'à une époque où l'humanité peut pleinement espérer la victoire, nous construirons pour vous un monument plus grand et plus glorieux sur une belle planète, que ce soit c'est sur la terre, la lune ou Mars, Jupiter.

Le prix von Carmen, le prix Nobel, le prix Moon et le prix Mars, leurs grandes contributions et leur dévouement, dépassent de loin la valeur et la grande importance contenues dans ces célèbres prix et brillent à travers les âges. Ici, pas seulement pour les grands scientifiques

Les explorateurs devraient rendre hommage à ces guerriers spatiaux. Pour nos enfants et nos petits-enfants, des milliers d'années et des dizaines de milliers d'années plus tard, ils chériront et se souviendront sûrement profondément de ces martyrs et ancêtres, oui, oui. Que ce soit sur terre ou sur la lune, ou des gens qui vivent sur Mars ou d'autres planètes.

Digitized by srujanika@gmail.com

A horizontal line of 20 black dots, evenly spaced, used as a decorative separator.

Mars 2020 vers la lune, vers Mars, vers une planète plus éloignée (projet global de migration humaine)

Les planètes préférées incluent le facteur de risque, la faisabilité réaliste, la fiabilité et la sécurité, le coût total de l'investissement, la maturité technologique, le temps d'achèvement, la probabilité d'évaluation du succès, le taux de rendement commercial, etc.

1 ♣♣♣♣♣ Terre (régions polaires et arctiques, déserts, montagnes, plages désertes, océans, etc.) 500 billions USD Élevé

2 ♣♣♣♣♣ Lune Oui On peut immigrer de 1 milliard à 2 milliards de personnes 350-2250 trillions Oui Élevé

3 ♣♣♣♣♣♣♣♣ Mars 2 mai Immigrant 1 milliard-6 50-3200 trillions En attente

4 satellite Satellite Jupiter 2 4 veille faible

-5 satellite Saturn satellite Saturn 6 cinq en attente faible

Moteur aérospatial

